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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/524,585

03/31/2005

Nobuyoshi Koshida

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03/18/2009

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EXAMINER

LE, HUYEN D

ART UNIT

PAPER NUMBER

2614

MAIL DATE

DELIVERY MODE

03/18/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/524,585	<b>Applicant(s)</b> KOSHIDA ET AL.	
	<b>Examiner</b> HUYEN D. LE	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/15/05</u> .  | 6) <input type="checkbox"/> Other: _____                          |

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## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed 02/05/05 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

The references of JP 62-263062, JP 9-505913 and the document of Shinoda et al., pages 853-855 as listed in IDS filed 02/15/05 can not be found in the record.

### ***Claim Objections***

2. Claim 14 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 14 does not have a further limitation from claim 9.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Shinoda (JP 11-300274).

Regarding claims 1-2, Shinoda teaches a thermally induced sound wave generating device comprising a thermally conductive substrate (1, 7, 12), a heat insulation layer (2, 8, 14), and a heat element thin film (3, 9, 15) formed on the heat insulation layer (2) and in the form of an electrically driven metal film as claimed. Since the thermally conductive substrate (1, 7, 12) is a substrate of silicon and the heat insulation layer (2, 8, 14) is formed of porous silicon (page 7, lines 10-18), the Shinoda device includes the product of the thermal conductivity and the heat capacity of the thermally conductive substrate and the heat insulation layer as claimed (also see the Table 1 on page 9 of the specification of the present application).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinoda (JP 11-300274).

Regarding claim 3, Shinoda does not specifically disclose that the substrate (1) consists of a ceramics substrate as claimed. However, Shinoda does not restrict to the material for the substrate (page 7, line 16).

Therefore, it would have been obvious to one skilled in the art to provide any material for the substrate (1, 7, 12) such as a ceramics substrate for the desired purpose of improving efficiency of the ultrasonic wave generation.

Regarding claim 4, Shinoda teaches the heat insulation layer (2, 8, 14) is a porous silicon layer. Shinoda does not specifically teach the porous silicon layer (2, 8, 14) that is formed on the surface of the substrate (1, 7, 12) by making polycrystalline silicon porous as claimed.

However, Shinoda does not restrict to the material for the heat insulation layer (page 16, lines 1-3); it therefore would have been obvious to one skilled in the art to provide any material for the insulation layer such as polycrystalline silicon porous for an alternate choice and better providing a low heat transfer factor between the heat generating member and the substrate.

Regarding claim 5, Shinoda teaches the heat insulation layer (2, 8, 14) is a porous silicon layer. Shinoda does not specifically teach the porous silicon layer (2, 8, 14) that has silicon grains of a columnar structure as claimed.

However, Shinoda does not restrict to the material for the heat insulation layer (page 16, lines 1-3); it therefore would have been obvious to one skilled in the art to provide any material

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for the insulation layer (2, 8, 14) such as the porous silicon layer that has silicon grains of a columnar structure for providing a better material to increase the temperature change on the surface of the heat generating member and improve the generation efficiency of the ultrasonic wave.

Regarding claims 6-8, 10, 11 and 15-17, Shinoda teaches the heat insulation layer (2, 8, 14) is a porous silicon layer (2, 8, 14) which is obtained by electro-chemical treatment (see the paragraph [0024]). Shinoda does not specifically teach the dielectric films formed on surfaces of nanocrystalline silicon in the porous silicon layer as claimed.

However, Shinoda does not restrict to the material for the heat insulation layer (page 16, lines 1-3); it therefore would have been obvious to one skilled in the art to provide any material for the insulation layer (2, 8, 14) such as providing dielectric films being oxide films or nitride films that are formed on surfaces of nanocrystalline silicon in the porous silicon layer (the insulation layer 2, 8, 14) for better providing a low heat transfer factor between the heat generating member and the substrate, and for the desired purpose of increasing the temperature change on the surface of the heat generating member (3, 9, 15) and improving efficiency of the ultrasonic wave generation.

Regarding claims 9 and 12-14, Shinoda does not specifically disclose that the dielectric films in the porous silicon layer are formed according to heat treatment. However, it would have been obvious to one skilled in the art to form the dielectric films in the porous silicon layer (2, 8, 14) in any treatment such as heat treatment for an alternate choice and providing a better material for the porous silicon layer to increase the temperature change on the surface of the heat generating member and improve the generation efficiency of the ultrasonic wave.

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***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Baumgartner (US 7,441,321) teaches method of manufacturing ultrasound transducer device having acoustic backing.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUYEN D. LE whose telephone number is (571) 272-7502. The examiner can normally be reached on 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CURTIS KUNTZ can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HUYEN D. LE/  
Primary Examiner, Art Unit 2614

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March 16, 2009